Introduction:
The goal of this report is to describe the advanced approach taken to solve Killer Sudoku puzzles.
Unfortunately I was unable to complete my implementation due to time constraint hence, I have described below the strategies that I have implemented in-order to solve an advanced killer sudoku puzzle more efficiently.
Representation of the Killer Sudoku Puzzle:
The basic elements of a Killer Sudoku puzzle are: cells, cages, rows, columns, boxes and values.

- Cells: The Cell class describes one cell in our Killer Sudoku Puzzle. It has a row and column attributes, to signify it's position in the grid (column 0 being the left-most column and row 0 being the top-most row). It also has a value attribute (initialised as 0) as well as a cage index since a cell can only belong to one cage.
- Cage: The Cage class describes each coloured block in the Killer Sudoku puzzle. It has a sum attribute and a variable list of Cells.
- Killer Sudoku Grid: The Killer Sudoku Grid class has two attributes, a 2D array of Cells which is used to update the value of individual Cells and an array of Cages.

Advanced Solver:

Sum Elimination: This strategy involves examining different ways of calculating all the possible combinations which can make up the sum of a given cage.The solution of a sudoku can often be found by eliminating the number of different possible ways of making a sum.For example if a 2-cage has a total of 3, 4,16 or 17 there is only one combination of values that can be used.(3=2+1, 4=3+1, 16=9+7, and 17=9+8.) 3-cages with only 1 combination are: 6=1+2+3, 7=1+2+4, 23=9+8+6, 24=9+8+7.

Rule Of 45: This involves the comparisons of regions with cages. A region must contain all the values specified in the file for example a 9 by 9 grid should contain all the numbers from 1 to 9 in each row, column and box, meaning the sum for that region is 45.Therefore, if S is the sum of the totals of every cage contained entirely within the region in question, the remaining cells not covered by these cages must sum to 45-S. For exmaple a cage of size 2 and total of 12 and another cage of size 4 total 15 are contained in one column. They represent a total sum of 27, The remaining 3 cells in that colour which are in cages not entirely contained within the column must sum to 45-27, giving 18. The 3 cells can now be treated as a new cage of size 3 and total 18